

ACIDS, BASES & TITRATION 3

Mark scheme

Question 1

Question	Answer	Extra information	Marks
(a)	Drain Buster is a concentrated sodium hydroxide solution that would damage the skin		1
	Therefore, it is diluted so that it is safe to use for the experiment		1
(b)			
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response.			
0 marks	Level 1 (1-2 marks)	Level 2 (3-4 marks)	Level 3 (5-6 marks)
No relevant content.	There is a brief description of the titration that may include a risk assessment.	There is some description of the titration that may include a risk assessment.	There is a clear, balanced and detailed description of the titration and an appropriate risk assessment.
<p>examples of the chemistry points made in the response</p> <ul style="list-style-type: none"> • burette / acid / HCl used correctly • pipette used for Drain Buster solution / alkali / NaOH correctly • read meniscus at eye level • acid / HCl added dropwise • indicator used • white background/tile • end-point of titration recorded • swirling / mixing • repeat <p>example of risk assessment points made in the response e.g.</p> <ul style="list-style-type: none"> • Wear safety goggles - to protect eyes because hydrochloric acid is corrosive / irritant and / or sodium hydroxide is caustic 			
Total marks			8

Question 2

Questions	Answers	Extra information	Marks
(i)	ethanol has only covalent bonds in its molecule		1
(ii)	acidic		1
Total marks			2

Question 3

Questions	Answers	Extra information	Marks
(i)	because hydrochloric acid is a strong(er) acid which ionises more	allow converse throughout 'it' refers to hydrochloric acid allow because hydrochloric acid has lower pH accept produces / has more hydrogen ions / H ⁺ ions	1 1
Total marks			2

Question 4

Questions	Answers	Extra information	Marks
(a)(i)	burette		1
(ii)	indicator		1
(iii)	colour change		1
(b)(i)	any one from: <ul style="list-style-type: none">• volume of (hydrochloric) acid• concentration of (hydrochloric) acid• concentration of (sodium) hydroxide	allow amount of (hydrochloric) acid allow concentration of alkali	1
(ii)	22.3(0)		1
Total marks			5

Question 5

Questions	Answers	Extra information	Marks
(a)(i)	$(19.5 + 18.5 + 19.0)/3$	allow $(23.0 + 19.5 + 18.5 + 19.0)/4$ for 1 mark	2
(ii)	R P Q	allow Q P R for 1 mark	2
(b)	any two from: <ul style="list-style-type: none">• repeat more times• calculate a mean• measure to one decimal place		2
(c)	both students get similar results / similar pattern		1
Total marks			7